

REMARKS

First, the Examiner is thanked for the courtesies extended to the undersigned in a telephone conversation on March 23, 2009, in which the possible rejoinder of the withdrawn claims and the amendments to the claims presented in the Amendment and Response under 37 U.S.C. § 1.114 were discussed. It was verified that the dependency of claims 9 through 12 on cancelled claim 8 was erroneous and that the Examiner's understanding that these claims ought now depend from claim 6 is correct. In another telephone conversation on September 29, 2009, the undersigned confirmed Applicants' intent to file the present response. Finally, the express withdrawal of the rejection of claims 6 and 8 to 12 under 35 U.S.C. § 103(a) as obvious over European Patent No. 0 402 213, by Klock, in view of U.S. Patent No. 3,153,009, issued to Rombach et al., U.S. Patent 6,472,054, issued to Aurenty et al., and U.S. Patent 5,559,175, issued to Kroggel et al., is acknowledged with gratitude.

In a second preliminary matter, several purely formal amendments to the claims are presented herein. Specifically, a percentage sign (%) is now used to designate values of tensile creep in claims 1, 5, 6 and 18. In addition, the dependency of claim 5 from cancelled claim 4 is removed; newly amended claim 5 depends from claim 3. Likewise, the dependency of claims 9 to 12 from cancelled claim 8 is also removed; newly amended claims 9 to 12 depend from claim 6. These amendments are unrelated to patentability and do not affect the scope of the claims. Accordingly, no new matter is introduced into the application by these amendments.

In addition, it is believed that these amendments are sufficient to overcome the objection to claim 6 and the rejection of claims 9 to 12 under 35 U.S.C. § 112. Accordingly, it is respectfully requested that this objection and rejection be withdrawn upon reconsideration.

Turning now to substantive issues, the Official Action issued on April 3, 2009, has rejected claims 6, 10 and 11 under 35 U.S.C. § 103(a) as obvious over European Patent No. 0 402 213 by Klock (hereinafter "Klock") in view of U.S. Patent No. 3,153,009, issued to Rombach et al. (hereinafter "Rombach") and further in view of U.S. Patent No. 4,297,262, issued to Phillips (hereinafter "Phillips '262") or of U.S. Patent No. 4,276,351, issued to Phillips (hereinafter "Phillips '351"). In addition, claim 9 is rejected under 35 U.S.C. § 103(a) as unpatentable over Klock in view of Rombach and Phillips (presumably Phillips '262 and '351) and further in view of U.S. Patent 6,472,054, issued to Aurenty et al. (hereinafter "Aurenty"). Finally, claim 12 is rejected under 35 U.S.C. § 103(a) as unpatentable over Klock in view of Rombach and Phillips (presumably Phillips '262 and '351) and further in view of U.S. Patent 5,559,175 issued to Kroggel et al. (hereinafter "Kroggel").

These are the sole substantive reasons set forth in the Official Action why the present claims should not be allowed. The facts and reasoning set forth earlier in the prosecution are neither withdrawn nor abandoned. In addition, Applicants respectfully traverse these rejections for the further reasons set forth below.

First, with respect to the rejection citing Klock in view of Rombach, it is well established that references **cannot be combined**, when the references themselves teach away from their combination. See, e.g., M.P.E.P. at § 2145(X)(D)(2), *citing In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). In *Grasselli*, as in the present application, the teachings of the references were not merely mutually exclusive, but in fact truly antithetical to each other.

To reiterate briefly, the surfactants described by Klock are present in an amount of greater than 0.3 wt% or greater than 0.4 wt% based upon the dry weight of PVA (page 2 at lines 46 to 54). These high levels of surfactant are described as necessary to obtain a high level of meso rings, and therefore greater rigidity, in the PVB polymer (page 3 at lines 3 to 10).

Rombach, in contrast, teaches that using a lower amount of surfactant will reduce or eliminate haze in polyvinyl acetals. See column 1 at lines 32 to 36 and at line 63 continuing to column 2 at line 3. For these reasons, Rombach permits only 0.04 to 0.2 wt% of surfactant, based on the weight of the polyvinyl alcohol. Column 2 at lines 16 to 21. Significantly, this range is mutually exclusive from the range of “greater than 0.3 wt%” that is described in Klock. Also in contrast to Klock, Rombach teaches that the use of higher levels of surfactants will affect other properties of the resin. The clear implication is that these effects will be adverse. Column 2 at lines 21 to 22.

Plainly, then, Klock and Rombach teach away from each other. Accordingly, it is improper to cite Klock in view of Rombach in rejecting the present claims.

Likewise, it is well established that two references may not be combined “[i]f [the] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, [because] then there is no suggestion or motivation to make the proposed modification.” M.P.E.P. at § 2143.01(V). See *also id.* at § 2145(III). Adding a higher level of surfactants to the composition described in Rombach will increase the haze of the product (column 1 at lines 32 to 36), thus rendering it unfit for its intended use, specifically, “as a safety glass interlayer, which require[s] excellent optical clarity.” Column 1 at lines 66 to 72. Decreasing the level of surfactants in Klock will result in a lower level of meso rings, and therefore greater flexibility in the PVB polymer. Page 3 at lines 3 to 10. Greater flexibility renders sheets of the PVB polymer unfit for their intended use in automated systems for gripping and cutting laminated glazings, such as windshields. Page 4 at lines 2 to 5. Clearly, then, combining the Klock and Rombach references renders each of the prior art compositions unfit for its intended purpose. Therefore, there are at least two reasons why it is improper to combine the Klock and Rombach references.

Even assuming, *arguendo*, that the combination of Klock and Rombach forms a proper basis for a rejection under 35 U.S.C. § 103, it is also well established that a *prima facie* case of obviousness may be rebutted by evidence of unexpectedly improved

properties. M.P.E.P. § 2145. In this connection, Applicants respectfully submit that the present claims define a process that provides an unpredictable, inventive solution to a problem that exists in the prior art.

Here, Klock describes a process that is difficult and inefficient because it must be carried out under carefully controlled conditions in which the temperature of the reaction mixture is tightly controlled and systematically varied over set periods of time. See, *e.g.*, English translation of Klock, 2nd paragraph of page 1:

...one maintains the mixture under agitation for **one duration higher than 30 minutes at a temperature from 8 to 150 C**, one raises then the temperature of the mixture up to a value maintained **between 60 and 800 C in a lapse of time ranging between one hour and half and 4 hours**, when the aforementioned value of temperature is reached, one incorporate a base in the mixture until obtaining a pH ranging between 9 and 11, **one maintains then the temperature with the aforementioned value for one duration higher than fifteen minutes**, one separates the polyvinylbutyral precipitated mixture, and one washes it with water.

It had been believed that this procedure was necessary to produce a polymer having a M/R ratio that is high enough for the polymer to be useful as the interlayer of a safety glass windshield. (The M/R ratio is correlated with the flex modulus.) See Klock, page 2 at lines 37 to 41; English translation at top of page 3.

In contrast, the claimed process can be run at a single temperature, or within a narrow temperature range. See Claim 6 and the Examples of the invention. In particular, in Example 1, the reaction temperature is held at 90°C. This is the procedure followed in Examples 2 through 26; in Examples 27 through 40, the reaction temperature is varied over ranges that are generally smaller than the range of 82°C to 91°C.

Advantageously, the feature of running at a single temperature, or within a narrow temperature range, enables the elimination of the extra regulation and equipment, such

as heat exchangers, that are required to run a process with a controlled temperature gradient.

Surprisingly, the M/R ratio of the polymer produced in the claimed process is lower than that which is considered necessary in the Klock reference, and yet the product still has a tensile creep that is low enough for the polymer to be useful as the interlayer of a safety glass windshield. See Klock, page 3 at lines 7 to 18; English translation, last two paragraphs of page 3 and first paragraph of page 4.

It had been known that materials having a lower M/R ratio could be suitable for this use, if higher levels of surfactant were added to the reaction mixture. See Klock, page 3 at lines 1 to 6; English translation, 5th and 6th paragraphs of page 3. Higher surfactant levels entail a number of known disadvantages, though, including increased material costs, excessive foaming in the reaction vessel, an additional washing step to remove excess surfactant from the polymer, and unacceptable optical defects in the final product. See Klock, page 1 at lines 25 to 33; English translation, 4th full paragraph of page 1. See *also* Rombach, column 2 at lines 16 to 22.

It has now unexpectedly been discovered, however, that the surfactant may be kept at an advantageously low level, if the surfactant is sodium methyl cocoyl taurate or a mixture of sodium methyl cocoyl taurate with sodium dioctylsulfosuccinate or sodium lauryl sulfate.

To summarize, then, the problem of producing a polymer that is suitable for use as the interlayer of a safety glass windshield using a simplified process is solved by using a single-temperature process. The polymer thus produced is acceptable, despite its lower M/R and its lower level of surfactant, because of the selection of a particular surfactant or surfactant mixture.

Applicants respectfully submit that the foregoing facts constitute evidence of unexpected superior results that are obtained through the claimed processes.

Applicants further respectfully submit that these unexpected superior results are sufficient to overcome any *prima facie* case of the obviousness of claim 6 that may be based on Klock in view of Rombach.

Turning now to the other references that are cited in the Official Action of April 3, 2009, it is similarly well established that a *prima facie* case of obviousness is not made out unless a reasonable expectation for the success of the claimed invention is found in the prior art. M.P.E.P. at § 2143.02. Significantly here, neither Phillips '262 nor Phillips '351 includes any description whatsoever of a process for synthesizing polyvinyl butyral, of the claimed reaction conditions, the claimed process steps, the meso to racemic ratio, or the specifically recited physical properties of the polyvinyl butyral resin composition.

In particular, Applicants point out that Phillips '262 and '351 include several examples of plasticized PVB resins having tensile creep of over 20% (Example 17 in Table III of '262), over 30% (Example 16 in Table II of '262), and even over 40% (Examples 19 and 20 in Table V of '262; Example 1 in Table I of '351). Moreover, Phillips '262 and '351 include not one example of a PVB that approaches the tensile creep of **less than 2.5%** that is clearly recited in claim 6. (For measurement conditions, see the specification on page 12; Phillips '262 in column 4 at lines 20 to 28; and Phillips '351 in column 3 at lines 60 to 68. Applicants respectfully submit that, all other factors being equal, a difference of 5C° in oven temperature is unlikely to result in a difference of about a **factor of 20** in tensile creep.) Therefore, the Phillips patents, whether considered individually or in combination with Klock and Rombach, do not provide a reasonable expectation for the success of Applicants' claimed invention. Consequently, Applicants respectfully submit that claim 6, as amended herein, is not obvious over Klock in view of Rombach and Phillips '262 or '351.

With respect to the other references cited in the Official Action, Aurenty, whether considered alone or in combination with Klock, Rombach and Phillips, does not describe the claimed reaction conditions, the claimed process steps, the meso to racemic ratio, or the specifically recited physical properties of the polyvinyl butyral resin composition. In

summary, the success of Applicants' claimed process for polymer synthesis simply could not be predicted, based on the use of a particular surfactant to control ink spreading. For these reasons, Applicants respectfully submit that claim 6 is not obvious over Klock in view of Rombach and Phillips and further in view of Aurenty.

Likewise, Kroggel, whether considered alone or in combination with Klock, Rombach, Phillips, and Aurenty provides no teaching or suggestion of the specifically recited plasticizers, merely a generic reference to the *Modern Plastics Encyclopedia* and a brief description of some "diesters of aliphatic diols with aliphatic carboxylic acids". See the paragraph bridging columns 6 and 7. Kroggel also does not describe the claimed reaction conditions, the claimed process steps, the meso to racemic ratio, or the specifically recited physical properties of the polyvinyl butyral resin composition. Nor could the success of Applicants' claimed process for polymer synthesis be predicted, based on the use of a particular acid in an emulsion process. Therefore, claim 6 is also not obvious over Klock in view of Rombach and Phillips and further in view of Kroggel.

Accordingly, Applicants respectfully request that the rejection of claim 6, as amended herein, under 35 U.S.C. § 103 be withdrawn upon reconsideration.

In closing, claims 9 to 12 depend, directly or indirectly, from claim 6. It follows by statute that claims 9 to 12 are also not obvious over the cited references, for at least the same reasons that newly amended claim 6 is not obvious. Consequently, Applicants respectfully request that the rejections of claims 9 to 12 under 35 U.S.C. § 103 also be withdrawn upon reconsideration. Applicants further respectfully request that withdrawn claims 1, 2, 3, 5, 13 to 16, 18 and 19 be rejoined to the claims under examination upon indication of allowable subject matter in those claims.

Conclusion

A petition for an Extension of Time to reply (three months), and the fee for the petition, are submitted herewith. Should any further fee be required in connection with the present response, the Examiner is authorized to charge such fee, or render any credit, to Deposit Account No. 04-1928 (E.I. du Pont de Nemours and Company).

In view of the foregoing amendments and remarks, it is believed that the pending claims are in condition for immediate allowance, and such action is earnestly solicited. Should the Examiner believe that an interview or other action in Applicants' behalf would expedite prosecution of the application, the Examiner is urged to contact Applicants' undersigned attorney by telephone at (302) 892-1004.

Respectfully submitted,

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